

CLAIMS

- 1 An eyeglass device comprising:
a first frame including
- 5 two retaining mechanisms for supporting a pair of lenses, and
defining a frontal plane,
a bridge connecting the two retaining mechanisms and holding the
two retaining mechanisms together, and
a magnetic member at the bridge for magnetically coupling to
- 10 another magnetic member at the bridge of a second frame;
such that when coupled, the two frames are attached together, and due to
the locations of the magnetic members, one of the frames is restricted from
moving downwards relative to the other frame.
- 15 2. An eyeglass device as recited in Claim 1 wherein the coupling occurs at a
coupling surface on the second frame that is substantially perpendicular to the
frontal plane.
3. An eyeglass device as recited in Claim 1 wherein the magnetic member at
- 20 the bridge of the first frame is a permanent magnet.
4. An eyeglass device as recited in Claim 1 wherein the magnetic member at
the bridge of the first frame is in a cavity to receive the second frame's magnetic
member, which protrudes from the member, with at least a part of the protrusion
- 25 fitting into the cavity.
5. An eyeglass device as recited in Claim 1 wherein the magnetic member at
the bridge of the first frame comprises two separate parts, with each part being
adjacent to one of the retaining mechanisms.

6. An eyeglass device as recited in Claim 1 wherein the bridge of the first frame further includes a cavity to receive a protrusion at the bridge of the second frame so as to further secure the attachment of the two frames when coupled.

5 7. An eyeglass device as recited in Claim 6 wherein:
the first frame is an auxiliary frame to be coupled to the second frame,
which is a primary frame; and
the magnetic member at the auxiliary frame is a permanent magnet to be
coupled to the second frame's magnetic member, which is a magnetizable
10 member.

8. An eyeglass device as recited in Claim 1 wherein:
the bridge of the first frame further includes a U-shaped structure having
two arms; and
15 the magnetic member at the first frame is disposed at least on one of the
arms;
such that magnetic coupling occurs when the bridge of the second frame
is sandwiched between the arms of the U-shaped structure.

20 9. An eyeglass device as recited in Claim 2 wherein the angle between the
coupling surface and the frontal plane is approximately between 135 degrees and
45 degrees.

10. An eyeglass device as recited in claim 1 wherein the first frame is an
25 auxiliary frame to receive the second frame, which is a primary frame.

11. An eyeglass device as recited in Claim 10 wherein the bridge of the
auxiliary frame includes a hinge so that the auxiliary frame can be folded.

12. An eyeglass device as recited in Claim 11 wherein the magnetic member at the bridge of the auxiliary frame comprises two separate parts, with each part being adjacent to one of the retaining mechanisms.

5 13. An eyeglass device as recited in Claim 10 wherein the auxiliary frame further includes a flange that extends from the bridge of the frame to further secure the attachment of the auxiliary frame to the primary frame.

10 14. An eyeglass device as recited in Claim 13 wherein the flange includes two lateral extensions, each extending laterally from one end of the bridge;
such that when the auxiliary frame is attached to the primary frame, a portion of each retaining mechanism of the primary frame is disposed between a portion of a retaining mechanism of the auxiliary frame and a portion of one lateral extension.

15 15. An eyeglass device as recited in Claim 13 wherein the flange includes a vertical extension, extending vertically from the bridge;
such that when the auxiliary frame is attached to the primary frame, the bridge of the primary frame is disposed between frontal plane and at least a
20 portion of the extension.

25 16. An eyeglass device as recited in Claim 15 wherein the width of the bridge of the auxiliary frame is wider than the width of the bridge of the primary frame so that when the auxiliary frame is attached to the primary frame, there can be a gap between the flange and the bridge of the primary frame.

17. An eyeglass device as recited in Claim 15 wherein the extension subtends an extension angle with the bridge of the auxiliary frame, such that the extension angle is between 45 and 135 degrees.

18. An eyeglass device comprising:
a bridge connecting two retaining mechanism and holding them together,
with the two mechanisms supporting a pair of lenses of a first frame; and
a magnetic member at the bridge for magnetically coupling to another
magnetic member at the bridge of a second frame;

such that:

the two retaining mechanisms defines a frontal plane; and
when coupled, the two frames are attached together, and due to
the location of the magnetic members, one of the frames is restricted from
moving downwards relative to the other frame.

19. An eyeglass device as recited in claim 18 wherein the coupling occurs at
a coupling surface on the second frame that is substantially perpendicular to the
frontal plane.

20. An eyeglass device as recited in Claim 18 wherein the magnetic member
at the bridge of the first frame is a permanent magnet.

21. An eyeglass device as recited in Claim 18 wherein the magnetic member
at the bridge of the first frame is in a cavity to receive the second frame's
magnetic member, which protrudes from the member, with at least a part of the
protrusion fitting into the cavity.

22. An eyeglass device as recited in Claim 18 wherein the magnetic member
at the bridge of the first frame comprises two separate parts, with each part
being adjacent to one of the retaining mechanisms.

23. An eyeglass device as recited in Claim 18 wherein the bridge of the first
frame further includes a cavity to receive a protrusion at the bridge of the second

frame so as to further secure the attachment of the two frames when coupled.

24. An eyeglass device as recited in Claim 23 wherein:

the first frame is an auxiliary frame to be coupled to the second frame,
which is a primary frame; and

the magnetic member at the auxiliary frame is a permanent magnet to be
coupled to the second frame's magnetic member, which is a magnetizable
member.

25. An eyeglass device as recited in Claim 24 wherein:

the bridge of the auxiliary frame further includes a flange that extends
from the bridge of the frame to further secure the attachment of the auxiliary
frame to the primary frame; and

the flange includes a vertical extension, extending vertically from the
bridge;

such that when the auxiliary frame is attached to the primary frame, the
bridge of the primary frame is disposed between frontal plane and at least a
portion of the extension.

26. An eyeglass device comprising:

an auxiliary frame including

two retaining mechanisms for supporting a pair of lenses, and
defining a frontal plane,

a bridge connecting the two retaining mechanisms and holding
them together, and

a magnetic member at the bridge; and

a primary frame including

two retaining mechanisms for supporting a pair of lenses,

a bridge connecting the two retaining mechanisms and holding

them together, and

a magnetic member at the bridge for magnetically coupling to the magnetic member at the bridge of the auxiliary frame;

such that when coupled, the two frames are attached together; and due to the location of the magnetic members, the auxiliary frame is restricted from moving downwards relative to the primary frame.

27. An eyeglass device as recited in claim 26 wherein the coupling occurs at a coupling surface on the primary frame that is substantially perpendicular to the frontal plane.

28. An eyeglass device as recited in Claim 26 wherein the magnetic member at the bridge of the auxiliary frame is a permanent magnet.

29. An eyeglass device as recited in Claim 26 wherein each magnetic member at each bridge comprises two separate parts, with each part being adjacent to one of the retaining mechanisms of the corresponding frame.

30. An eyeglass device as recited in Claim 26 wherein the auxiliary frame further includes a flange that extends from the bridge of the frame to further secure the attachment of the auxiliary frame to the primary frame.

31. An eyeglass device as recited in Claim 28 wherein:
the bridge of the primary frame includes a protrusion; and
the bridge of the auxiliary frame includes a cavity to receive the protrusion at the bridge of the primary frame so as to further secure the attachment of the two frames when coupled.

32. An eyeglass device as recited in Claim 31 wherein:

the bridge of the auxiliary frame further includes a flange that extends from the bridge of the frame to further secure the attachment of the auxiliary frame to the primary frame; and

the flange includes a vertical extension, extending vertically from the bridge;

such that when the auxiliary frame is attached to the primary frame, the bridge of the primary frame is disposed between frontal plane and at least a portion of the extension.

33. An eyeglass device comprising:

a primary frame including

two retaining mechanisms for supporting a pair of lenses, and defining a frontal plane,

a bridge connecting the two retaining mechanisms, and holding them together, and

a first magnetic member at the bridge for magnetically coupling to a second magnetic member at the bridge of an auxiliary frame;

such that when coupled, the two frames are attached together, and due to the location of the magnetic members, the auxiliary frame is restricted from moving downwards relative to the primary frame.

34. An eyeglass device as recited in claim 33 wherein the coupling occurs at a coupling surface on the primary frame that is substantially perpendicular to the frontal plane.

35. An eyeglass device as recited in Claim 33 wherein the magnetic member at the bridge of the primary frame is a magnetizable member.

36. An eyeglass device as recited in Claim 33 wherein each magnetic member

at each bridge comprises two separate parts, with each part being adjacent to one of the retaining mechanisms of the corresponding frame.

37. An eyeglass device as recited in Claim 33 wherein the primary frame can be attached to the auxiliary frame, which further includes a flange that extends from the bridge of the auxiliary frame to further secure the attachment of the auxiliary frame to the primary frame.

38. An eyeglass device as recited in Claim 37 wherein the bridge of the primary frame includes a cavity that can receive a protrusion at the bridge of the auxiliary frame so as to further secure the attachment of the two frames when coupled.

39. An eyeglass device as recited in Claim 38 wherein the primary frame can be attached to the auxiliary frame, which further includes a flange with a vertical extension that extends from the bridge of the auxiliary frame to further secure the attachment of the auxiliary frame to the primary frame;

such that when the primary frame is attached to the auxiliary frame, the bridge of the primary frame is disposed between frontal plane and at least a portion of the extension.

40. An eyeglass device as recited in Claim 2 wherein when the two frames are coupled, the orientation of the magnetic member of the first frame is substantially the same as the orientation of the magnetic member of the second frame at the coupling surface.

41. An eyeglass device as recited in Claim 2 wherein:
the first frame includes a first-frame coupling surface; and
the magnetic member of the first frame slightly protrudes from the first-

frame coupling surface to enhance magnetic coupling when the two frames are coupled.

42. An eyeglass device as recited in Claim 2 wherein at least one magnetic member slightly recedes from the coupling surface so that the two magnetic members magnetically, but not mechanically coupled, when the two frames are coupled together.

43. An eyeglass device as recited in Claim 2 wherein:
the surface of each magnetic member that is for magnetic coupling to another magnetic member is defined as a magnetic coupling surface; and
the magnetic coupling surface of each magnetic member has no bumps to enhance coupling between the two frames.

44. An eyeglass device as recited in Claim 3 wherein:
the permanent magnet is partially encapsulated by a housing in the first frame; and
the size of the permanent magnet is slightly larger than the size of the housing at least in one lateral dimension, which is a dimension that the housing is holding the magnet.

45. An eyeglass device as recited in Claim 2 wherein:
the surface of the permanent magnet that is for magnetic coupling to another magnetic member is defined as a magnetic coupling surface; and
the edges of the magnetic coupling surface are chamfered to remove any sharp corners.

46. An eyeglass device as recited in Claim 2 wherein:
the magnetic member at the bridge of the first frame is a permanent

magnet;

the permanent magnet has a magnetic field strength of at least 2500 gauss;

5 the permanent magnet has a magnetic coupling surface, which is the surface the magnet magnetically couples to the magnetic member of the second frame;

the magnetic coupling surface has a surface area of more than 14 mm square; and

the height of the permanent magnet is more than 1 mm.

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